

## Message to Energy Managers

Often the best ideas come from others' success. That is why we are featuring two 2002 SECNAV winners in this issue. Naval Base San Diego established comprehensive energy management policies, including a "world class" demand reduction program. This almost immediately cut their demand by more than two megawatts. With the addition of MVWeb software, they were able to quickly identify and implement demand reduction opportunities, at almost no cost.

Norfolk Naval Shipyard achieved a 33% reduction in energy use from the FY90 baseline, more than 50% from the 1985 baseline. This spectacular performance is a result of upgrades, energy awareness among personnel, and exemplary conservation leadership.

As this issue of *energized* went to press, no announcement had yet been made on winners of FY01 Presidential Awards. The Presidential Award is the nation's most prestigious energy conservation award. If DON wins, we'll include it in our next issue!

## Naval Base San Diego Q&A

Naval Base San Diego is the 2002 SECNAV Large Activity energy award winner. In FY01, the energy team cut its shore facilities energy consumption by 25.7 million kWh from FY00 levels—more than 29%. Here, NBSD's energy manager talks about the nuts and bolts of their award-winning energy program, which may give ideas to other energy managers.

### Does part of your success stem from comprehensive energy management policies?

In April 2001, Navy Region Southwest published a 45-page comprehensive energy management directive encompassing every aspect of energy use at NAVBASE San Diego and the other Region bases. It set rigorous energy management policies, prescribed specific energy management measures, set energy design standards, and assigned roles and responsibilities. The Region published a directive on energy-efficient procurement, requiring all products to be in the top 25% of energy-efficiency for their class. The Region also published a new Utility Demand Reduction Program directive and a notice setting design policy for DDC systems in the San Diego area. These policy directives were supplemented by top-level energy policy messages from the Commander, Navy Region Southwest.

### You say NBSD implemented a "world class" demand reduction program.

We implemented numerous initiatives to cut electric demand during the California energy crisis of 2000 to 2001. These included establishment of the Regional Energy Program Office (REPO) and the Resource Efficiency Manager (REM) contract, aggressive

use of the MVWeb system, and the establishment of tough new energy policies. We instituted a Demand Reduction Program to



*Banner promoting energy conservation at NBSD*

meet the crisis, publicity and other awareness training, and other measures. These cut NAVBASE San Diego demand almost immediately by more than two megawatts at minimal cost, long before capital energy projects had any effect. These management measures saved money and nearly 60,000 MBtus of energy in FY01 alone and helped the San Diego region avoid the rolling blackouts that were common in Northern California.

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DON Energy Awareness Website: Access the tools on the Navy Energy website for ideas, planning tips, and tools. Set your browser to <<http://energy.navy.mil>> and scroll down the left-hand column to the Awareness pick.

## EPA: Let's Boost Recycling

**T**he EPA and the Bush administration have launched a campaign to encourage recycling of all kinds, in part a way to cut the generation of toxic chemicals. The campaign is called the Resource Conservation Challenge.

The idea is to, by 2005, boost the national recycling rate from 30% to at least 35% and curb the generation of 30 harmful chemicals found in hazardous waste by 50%. To help meet the goals of the Challenge, the agency also announced 12 new projects that will test creative approaches to waste minimization, energy recovery, recycling



and land revitalization.

EPA is asking citizens, organizations, and government entities to pursue more aggressive environmental practices, make smart environmental purchases, reuse more products, and recycle at least one pound of their household waste a day, a spokesperson said. That done, she said, the result will be less waste, more economic growth and greater energy savings and recovery.

The Resource Conservation Challenge includes projects that EPA recommended for their flexibility, innovation and public-private partnerships emphasis. The EPA plans to establish partnerships and alliances with industry, states and environmental groups to help meet the Challenge's goals. The agency will provide training, tools and technology assistance for businesses, government entities and citizen groups, and help get information about the initiative to the general population, particularly youth and minority groups, through outreach and assistance.

For more about the Resource Conservation Challenge, visit <http://www.epa.gov/epaoswer/osw/>

## FY01 Energy Achiever: Norfolk Naval Shipyard

**N**orfolk Naval Shipyard's energy conservation work in FY01 resulted in awards from SECNAV and FEMP this past month. Here are some of elements of their energy conservation work that brought them Navy and Federal distinction.

The Shipyard was cited for making major steps in its annual mission to improve energy performance, increase energy efficiency, employ energy-saving technology and Best Practices, continue to train and raise energy awareness among personnel, and provide exemplary energy and water conservation leadership.

It achieved a 33% reduction in energy use from the FY90 baseline, more than 50% from the 1985 baseline.

Through more than \$2.8 million in upgrades to HVAC, lighting, steam infrastructure, and other industrial energy uses, energy managers saved significant money and 61,412 MBtus in annual energy use.

Norfolk based its decisions to upgrade specific industrial and other equipment based on the energy manager's standard operating practice of reviewing designs and purchasing recommendations to ensure that energy efficiency is at the forefront of decision-making.

Energy managers there say the Shipyard encourages creativity in conserving energy and budget dollars. One result was an automatic rollup doors control system that resulted in project payback of 19 days! It also utilizes partnerships, as in a relamping initiative with Dominion Virginia power that led to retrofits and monetary savings.



*Aerial view of Norfolk Navy Shipyard*

## DON: Renewables Will Save Money

**N**avy, the University of Hawaii and Hawaiian Electric Co. are partnering on a project to help the Navy reduce energy costs. The venture involves research on non-polluting hydrogen fuel cells and other renewable energy.

A \$383 billion defense budget bill pending before the U.S. Congress contains \$2.5 million for a photovoltaic energy park and related research in Hawaii. Officials expect the project to start this fall.

"We're very interested in being able to evaluate the possibility for use here in Hawaii," a spokesperson for

the utility said. "These partnerships are required to get technology to the point where it's more cost effective and more realistic for commercial use, especially on a large scale."

The project's first phase involves construction of a 200-kilowatt photovoltaic array on Navy land, said Gary Jensen, mid-Pacific region director for the Office of Naval Research. The project expects to generate three megawatts of power from its solar panels, enough to provide electricity to approximately 730 homes. That would make it one of the largest photovoltaic energy projects in Hawaii.

### **Tell us about that Resource Efficiency Manager contract.**

The REM contract provides professional energy management services in support of in-house REPO and NAVBASE San Diego energy resources. During the energy crisis, REM support enabled NAVBASE San Diego to reach virtually every person and facility aboard the base with energy management assistance, training, and specialized support.

### **You also referred to MVWeb.**

MVWeb is off-the-shelf software that puts time-of-use electricity data into a user friendly, on-line display system. Implemented early in the California energy crisis, MVWeb made load profile and other key data available to building monitors and managers for the first time and clearly showed exactly how buildings were being operated. With training provided by REPO and the REM contract, NAVBASE San Diego was able to quickly identify and implement demand reduction opportunities, nearly all at no cost.

### **Broadly, what did your facility energy improvements entail?**

This project made a range of energy-efficiency improvements base-wide. Improvements included new, water-conserving fixtures; replacement or upgrade of HVAC equipment; installation of high efficiency motors; and replacement of inefficient electric and steam equipment.

### **Did Naval Base San Diego set a rigorous AC policy?**

One of the measures taken during the crisis was to eliminate air conditioning in non-critical, non-housing buildings, with exceptions made for medical facilities and buildings with other critical needs. Window air conditioners were allowed only on a case basis. Air conditioning for most facilities was limited to operating hours only. The base adopted the more rigorous of California Title 24 energy design standards plus 10%, or current Navy design standards for new buildings and major retrofits.

### **Describe the DDC & lighting retrofit cited in your SECNAV award presentation.**

This project installed direct digital controls (DDC) on lighting and air conditioning systems in NAVBASE San Diego facilities and tied these controls into the base-wide DDC system, enabling central monitoring and control of key systems. Lighting retrofits included installation of Stingray™ devices on high intensity discharge (HID) light fixtures, allowing the bulb wattage to be decreased with no perceptible loss of light. HID retrofits also included bi-level, or "high-low," controls to allow the lamps to go to half power when full light output was not needed. The project also improved zone controls so lights can be dimmed or turned off.

### **You implemented other lighting improvements as well.**

This Energy Savings Performance Contract (ESPC) project replaced over 1,000 HID light fixtures at NAVBASE San Diego with bi-axial fluorescent fixtures and T5-high output lamps with zone controls. This project greatly improved the quality of light while allowing occupants to turn lights off when not needed. This was the first Navy bi-axial fluorescent project in San Diego. It focused on bi-axial/T5 technology rather than the more traditional HID retrofits. The scope was limited to Shore Intermediate Maintenance Activity (SIMA) facilities, which are industrial in nature.

### **And let's not forget about streets and parking lots.**

Right, we installed approximately 100 new photocells control street lights base-wide. They are much more sensitive than previous photocells—MVWeb monitoring of street light circuits clearly shows the street lights turn off 20 to 30 minutes earlier in the morning and turn on 20 to 30 minutes later at night than previously. The new photocells are also less affected by the heavy morning marine layers (fog) in San Diego, which often kept the street lights on until late morning. We also installed bi-level parking lot controls, first at NAVBASE San Diego. Similar large-scale projects are ongoing at Navy and Marine Corps bases throughout San Diego.

## **Navy's New Gunk-O'Lyzer**

Office of Naval Research (ONR) researcher John Reintjes is a 'build a better mousetrap' type-of-guy. Today, one of his inventions could save money and energy, reducing costs for ships, Navy aircraft, electric power generation and other industrial activities.

Fine debris and particulate matter such as metal filings, chips, sand, rust, water, and fiber matter suspended in a ship's oil reservoirs can result in poor fuel efficiency, wear, stress, overheating, surface fatigue, misalignment, or system breakage. Years ago, Reintjes watched as oil samples from ships systems were sent ashore for particulate analysis. Three months could pass before results returned. Meanwhile, as engineers waited, a system might have been far less efficient than it might have been, or a catastrophic failure might have occurred.

Suspecting that there had to be a better way, he and his team began building an extensive virtual "library" of fine particulate matter that had been painstakingly identified by ferrography and microscopy. Then he designed a small system that passes laser pulses through oil samples to make images of debris. That debris is immediately classified using algorithms based on neural networking with about 97% accuracy.

ONR's system, called the LaserNet Fines (LNF) instrument, costs about \$30,000, which is a bargain considering the cost of system inefficiency or failure. "About 25% of all U.S. production capacity is inoperative at any given time due to mechanical failure," says Reintjes. "Inefficiency or downtime for failure or regularly scheduled maintenance is downright expensive. An engine or gear-box failure prevented can provide huge financial benefits to the Navy."

### **Holiday Season Reminder!**

Consider LED holiday lights to reduce your energy costs. They use less energy than incandescent lights and last longer. For a fact sheet, see the Energy Ideas Clearinghouse at [www.energyideas.org/library/holidaylights.cfm](http://www.energyideas.org/library/holidaylights.cfm)





## Check It Out



### Update Your Skills and Contacts

**Keys to Energy Management**, 5-6 Dec., Bethesda, MD. A program to help manage and lower energy consumption and cost. How building systems utilize energy, how to pinpoint potential savings through engineering and economic analyses. Organized by the Association of Energy Engineers, \$1050, info: 770-925-9633.

**Troubleshooting Electrical Control Circuits**, 17-19 Dec., Alexandria, VA. Wiring, operating, and troubleshooting of motor control circuits. Cost: \$1099; organized by National Technology Transfer. Info: 800-922-2820.

**Basics of Industrial Electricity**, 17-19 Dec., Boston, MA. AA seminar covering the all aspects of electricity, including terminology, common circuits, test equipment, safety, generators, motors and relays. Cost: \$1049; organized by National Technology Transfer. Info: 800-922-2820.

**The 2002 National Electrical Code (NEC)**, 29-31 Jan., Orlando, FL. Described as the most informative and detailed NEC course available. Provides a copy of the 2002 code book and materials you need to do your job. Cost: \$945; organized by University of Wisconsin—Madison. Info: 800-462-0876.

**Basics of Industrial Electricity**, 3-5 Dec., Englewood, CO. Seminar covering all the basics of electricity including terminology, common circuits, test equipment, safety, generators, motors and relays. Cost: \$1049; organized by National Technology Transfer, Inc. Info: 800-922-2820.

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## Watts News?

**We want to hear from you.**

*Tell us about the energy initiatives you're working on, the problems you encounter, and the solutions you discover.*

Submit article ideas, comments, or questions to:

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